

MDX-100/100RDS

SONY. SERVICE MANUAL

US Model
Canadian Model
E Model
MDX-100
AEP Model
UK Model
MDX-100RDS

SUPPLEMENT-1

File this supplement with the service manual.

Subject:

- Test Mode
- Electrical Adjustments

1. TEST MODE

Setting the Test Mode

Operate the steps 1 to 3 shown below without a disc.

1. Press **4**.
2. Press **5**.
3. Press **1** for 2 seconds.

All the display light up and the Test Mode is set.

Note: If a disc is inserted in this case, "SHUF 1" lights up and it becomes VOL MAX PLAY.

When canceling the test mode, press **OFF** button.

Setting and Function of Servo Adjustment Mode

- 1) After the Test Mode, press **MD** button to set Servo Adjustment Mode.
- 2) Function of the each button in Servo Adjustment Mode.

1 : FOCUS ON

2 : TRACKING ON

3 : LASER ON (MO)

4 : STOP

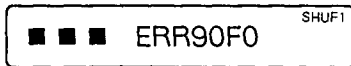
<< - MANU/DISC+ >> : SLED RVS/FWD

[<< - AMS/SEEK+ >>] : AMS \pm (Only in PLAY)

EJECT : EJECT

OFF : RESET (Canceling the Test Mode)

- 3) Insert a disc to press **1** \rightarrow **2**, and it plays without sound. Data is read discontinuously in the PLAY in normal mode, but in this mode, the eye pattern of the continuous reading is observed with oscilloscope. VOL MAX is received with **TUNER** \rightarrow **MD**.
- 4) Checking FOCUS, TRACKING ON



- **■** is blinking: FOCUS ON
- **■** is "MD": TRACKING ON

- 5) When canceling Servo Adjustment Mode, press **TUNER** or cancel the Test Mode by pressing **OFF**.

2. ELECTRICAL ADJUSTMENTS

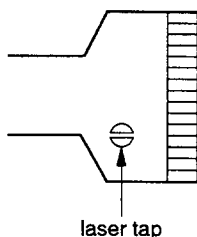
MINI DISC SECTION

Precaution in the Confirmation of Laser Diode Radiation

Do not look in from the top in confirming the radiation of Laser Diode for fear of the loss of eyesight.

Precaution in the Handling of Mini-Disc Device (KMS-150A)

Solder-bridge the laser tap of flexible board in handling the Laser Diode in the optical pick-up since it is very easy to be destroyed in the static electricity. Be fully prepared for the prevention of electrostatic destruction. Be careful in handling the flexible board since it is easy to be cut.



Optical Pick-Up Flexible Board

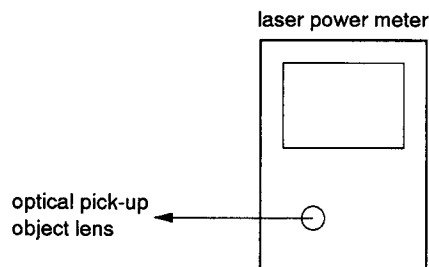
Precaution in the Adjustment

- 1) All the adjustment should be performed in order of the Test Mode. Cancel the Test Mode by pressing [OFF] button after the adjustment.
- 2) In some cases, SLED shift by [◀◀ - MANU/DISC + ▶▶] button or EJECT movement by [▲] button do not work. In those cases, cancel the Test Mode by pressing [OFF] button and reset the Test Mode.
- 3) Instrument and measure are shown below.
 - CD Test Disc TDYS-1 (Parts Code: 4-963-646-01)
 - Recorded MO Disc PTDM-1 (Parts Code: J-2501-054-A)
 - Laser Power Meter LPM-8001 (Parts Code: J-2501-046-A)
 - Oscilloscope (Band over 40 MHz. Measure after performing CAL of probe.)
 - Digital Voltmeter

Laser Power Adjustment

- 1) Adjustment by Laser Power Meter

Connection:

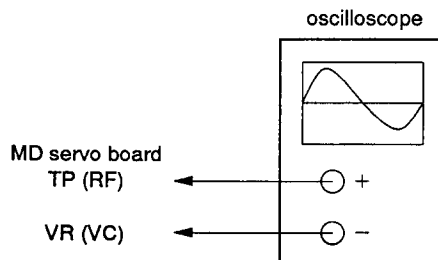


Procedure:

1. Turn RV529 fully counterclockwise.
2. Set it Servo Adjustment Mode of the Test Mode.
3. Adjust the position of the optical pick-up with [◀◀ - MANU/DISC + ▶▶] and set the Laser Power Meter on the object lens of the optical pick-up.
4. Press [3] button.
5. Adjust RV529 so that the Laser Power Meter shows $820 \pm 5 \mu W$.
6. Press [4] button.

- 2) Adjustment by an eye pattern.

Connection:



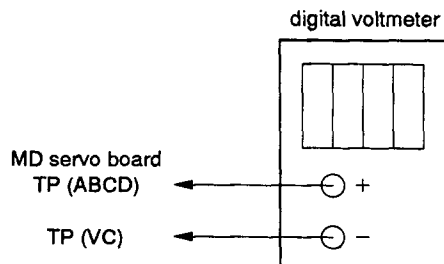
Procedure:

1. Turn RV529 fully counterclockwise.
2. Load and play back the CD Test Disc.
3. Adjust RV529 for an eye pattern of 1.5 Vp-p.



FOK Offset Adjustment

Connection:

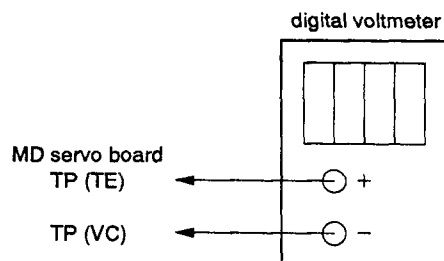


Procedure:

1. Connect a Digital Voltmeter between TP (ABCD) and TP (VC) of MD servo board.
2. Set it Servo Adjustment Mode of the Test Mode.
3. Press **[3]** button.
4. Adjust RV510 for -200 ± 50 mV on the voltmeter.
5. Press **[4]** button.

Tracking Offset Adjustment

Connection:

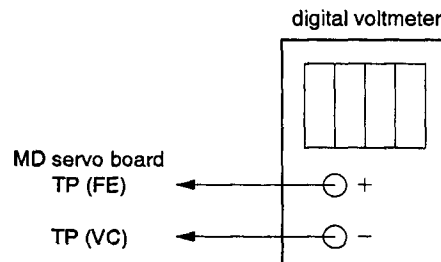


Procedure:

1. Connect a Digital Voltmeter between TP (TE) and TP (VC) of MD servo board.
2. Set it Servo Adjustment Mode of the Test Mode.
3. Press **[3]** button.
4. Adjust RV521 for 0 ± 50 mV on the voltmeter.
5. Press **[4]** button.

Premastered Focus Bias Adjustment

Connection:

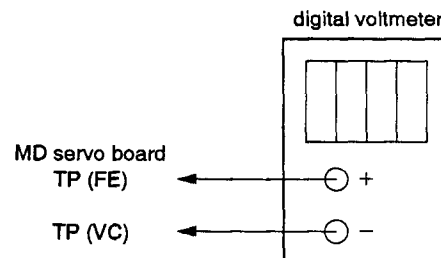


Procedure:

1. Connect a Digital Voltmeter between TP (FE) and TP (VC) of MD servo board.
2. Set it Servo Adjustment Mode of the Test Mode.
3. Press **[3]** button, then **[4]** button.
4. Adjust RV518 for 0 ± 10 mV on the voltmeter.
5. Press **[4]** button.

MO Focus Bias Adjustment

Connection:

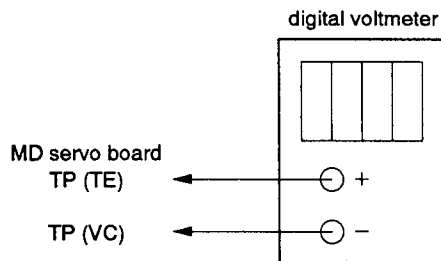


Procedure:

1. Connect a Digital Voltmeter between TP (FE) and TP (VC) of MD servo board.
2. Set it Servo Adjustment Mode of the Test Mode.
3. Press **[3]** button.
4. Adjust RV517 for -300 ± 10 mV on the voltmeter.
5. Press **[4]** button.

E-F Balance Adjustment

Connection:

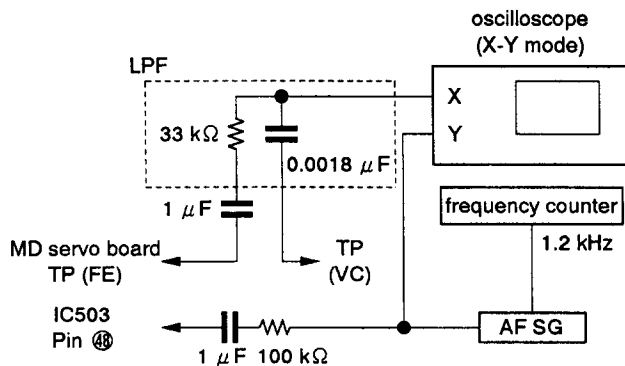


Procedure:

1. Connect the Digital Voltmeter between TP (TE) and TP (VC) of MD servo board.
2. Set it Servo Adjustment Mode of the Test Mode.
3. Move the optical pick-up to the most inside by keeping pressing button.
4. Press button once. (The SLED moves 1 step to the outer circumference.)
5. Load an MO disc.
6. Press button for focus on.
7. Adjust RV528 for 0 ± 100 mV on the voltmeter.
8. Press button.
9. Press button to eject the disc.

Focus Gain Adjustment

Connection:



Procedure:

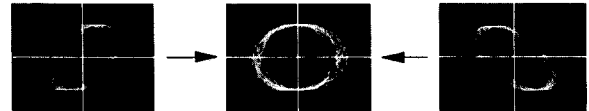
1. Connect as shown above.
2. Set it Servo Adjustment Mode of the Test Mode.
3. Move the optical pick-up to the most inside by keeping pressing button.
4. Press button once. (The SLED moves 1 step to the outer circumference.)
5. Load an MO disc.
6. Press button for focus on.
7. Press button for tracking.
8. Adjust RV543 so that the waveform observed on the oscilloscope is symmetrical to the vertical line at the center, as shown in figure (b).
9. Press button.

10. Press button to eject the disc.

Note: The level of ch. 1 (X) and ch. 2 (Y) are different by 10 times. Adjust the range of the oscilloscope so that observation is done in the same level.

(Lissajous Waveform)

Range: ch. 1 (X) = 20 mV
ch. 2 (Y) = 200 mV

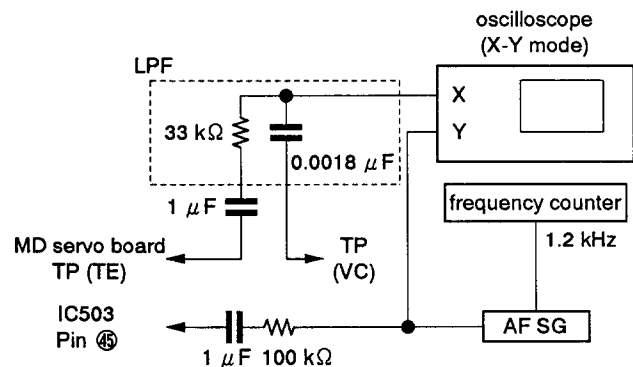


(a) Gain is too low. (b) Gain is appropriate. (c) Gain is too high.

Tracking Gain Adjustment

- 1) Method by the Lissajous Waveform.

Connection:



Procedure:

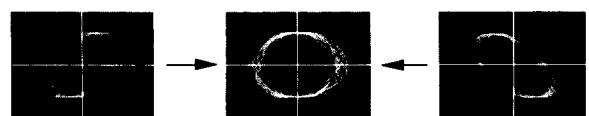
1. Connect as shown above.
2. Set it Servo Adjustment Mode of the Test Mode.
3. Move the optical pick-up to the most inside by keeping pressing button.
4. Press button once. (The SLED moves 1 step to the outer circumference.)
5. Load an MO disc.
6. Press button for focus on.
7. Press button for tracking.
8. Adjust RV542 so that the Lissajous Waveform on the oscilloscope is circle.
9. Press button.
10. Press button to eject the disc.

Note: 1. The level of ch. 1 (X) and ch. 2 (Y) are different by 10 times. Adjust the range of the oscilloscope so that observation is done in the same level.

2. In case that the Lissajous Waveform is not confirmed with the method shown above, perform with the summary adjustment method.

(Lissajous Waveform)

Range: ch. 1 (X) = 20 mV
ch. 2 (Y) = 200 mV

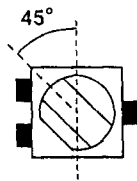


(a) Gain is too low. (b) Gain is appropriate. (c) Gain is too high.

Tracking Gain Coarse Adjustment

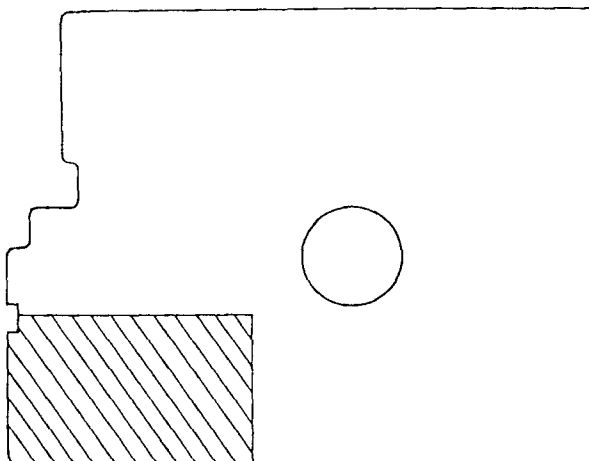
Procedure:

1. Set RV542 on the slope which is declined by 45 degrees, as shown below.

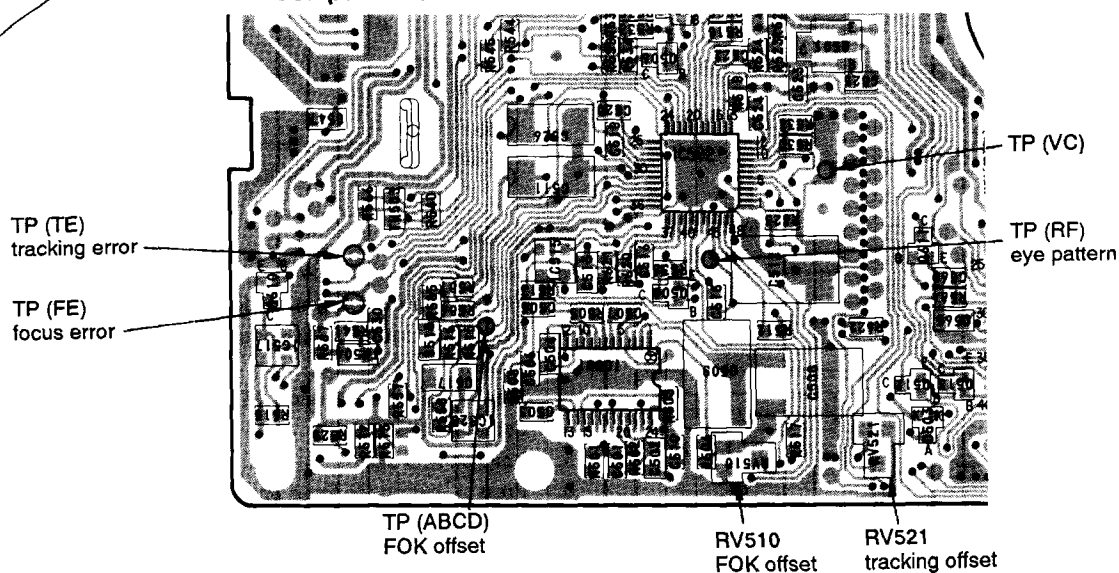


• Adjusting Parts Location

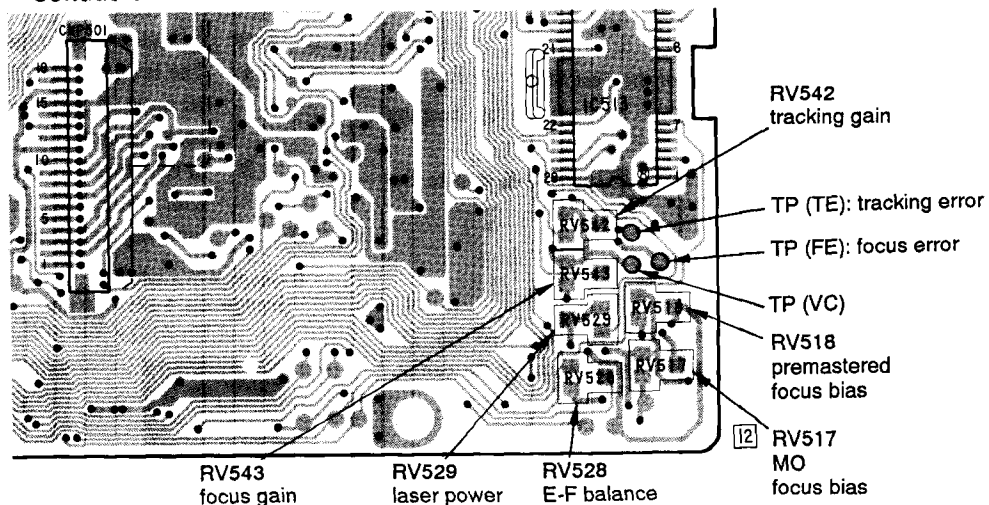
[MD SERVO BOARD]



— Component Side —



— Conductor Side —



TUNER SECTION

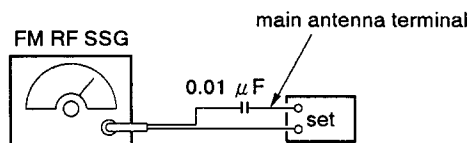
• Precaution in repairing

When front-end part is defective, exchange the whole front-end part since it is difficult to repair its inside.

FM Auto Scan/Stop Level Adjustment

Setting:

BAND switch: FM

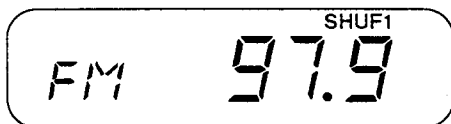


Carrier frequency: 97.9 MHz (US/Canadian)
98.0 MHz (Except US/Canadian)
Output level: 22 dB
Mode: mono, unmodulated

Procedure:

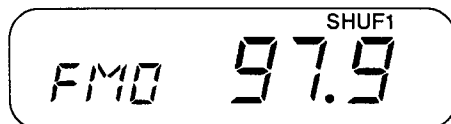
1. Set it the Test Mode.
2. Press the **TUNER** button and set it FM.

Display window (EX: US/Canadian)



3. Press **SEEK + >>>** button and adjust the built-in volume RV3 of TU1 so that "FM" indication turns to "FM0" on the display window. When the display window indicates "FM0" before the adjustment, start the adjustment after turning off the "0" indication by turning RV3.

Display window (EX: US/Canadian)



Standard Value: Stop response 22 dB \pm 3 dB

Note: "0" indication is tuning with the voltage of SD terminal (see page 9).

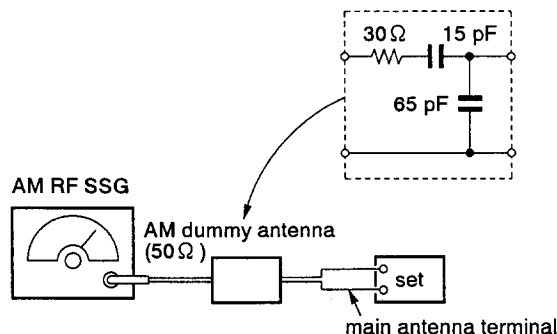
SD terminal voltage 0 V \rightarrow "0" OFF
SD terminal voltage 5 V \rightarrow "0" ON

AM Auto Scan/Stop Level Adjustment

Precaution: This adjustment should be performed after the FM auto scan/stop adjustment.

Setting:

BAND switch: AM

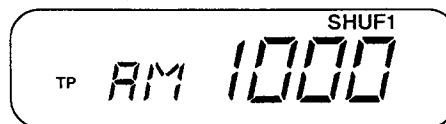


Frequency: 1000 kHz (US/Canadian)
999 kHz (Except US/Canadian)
Output level: 33 dB
Modulation: 30% AM modulation

Procedure:

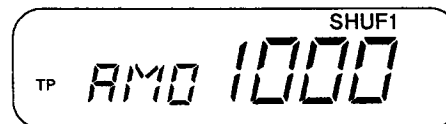
1. Set it Test Mode.
2. Press the **TUNER** button to set AM.

Display window (EX: US/Canadian)



3. Press **SEEK + >>>** button and adjust the built-in volume RV1 of TU1 so that "AM" indication turns to "AM0" on the display window. When the display window indicates "AM0" before the adjustment, start the adjustment after turning off the "0" indication by turning RV1.

Display window (EX: US/Canadian)



Standard Value: Stop response 33 dB \pm 3 dB

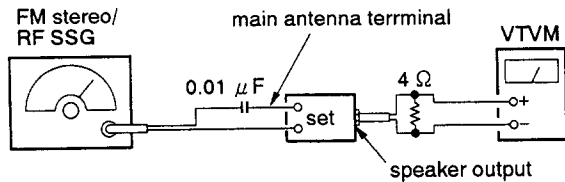
Note: "0" indication is tuning with the voltage of SD terminal (see page 9).

SD terminal voltage 0 V \rightarrow "0" OFF
SD terminal voltage 5 V \rightarrow "0" ON

High Cut Control Effect Adjustment

Setting:

BAND switch: FM



Carrier frequency: 97.9 MHz (US/Canadian)
98.0 MHz (Except US/Canadian)
Output level: 60 dB (1 mV)
Mode: mono
Modulation: 10 kHz, 40 kHz deviation

Procedure:

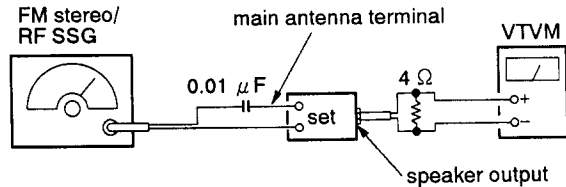
1. Tune it to 97.9 MHz or 98.0 MHz. This output level should be (A) dB.
2. Adjust the built-in volume RV2 of TU1 so that the output level when SSG input is 20 dB is (A) - 5 dB.

Adjustment Location: MAIN board TU1

FM Stereo Separation (60 dB) Adjustment

Setting:

BAND switch: FM



Carrier frequency: 97.9 MHz (US/Canadian)
98.0 MHz (Except US/Canadian)
Output level: 60 dB (1 mV)
Modulation : main; 1 kHz, 33.75 kHz deviation
sub; 1 kHz, 33.75 kHz deviation
19 kHz pilot; 7.5 kHz deviation

Procedure:

1. Adjust the built-in volume RV4 of TU1 for the best separation.

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ [ⓑ] Adjust RV4 for VTVM minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ [ⓓ] Adjust RV4 for VTVM minimum reading.

L-CH Stereo separation: Ⓐ - Ⓑ

R-CH Stereo separation: Ⓒ - Ⓓ

The separations of both channels should be equal.

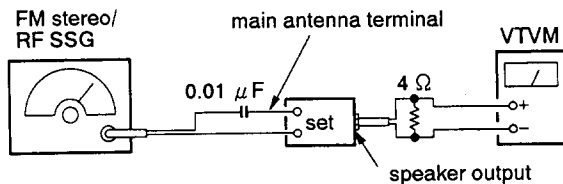
Adjustment Location: MAIN board TU1

Standard Value: Separation over 30 dB.

FM Noise Convergent Point Adjustment

Setting:

Band switch: FM



Carrier frequency: 97.9 MHz (US/Canadian)
98.0 MHz (Except US/Canadian)
Output level: 60 dB (1 mV)
Modulation : main; 1 kHz, 33.75 kHz deviation
sub; 1 kHz, 33.75 kHz deviation
19 kHz pilot; 7.5 kHz deviation

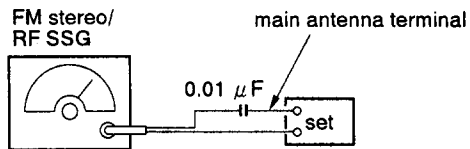
Procedure:

1. Tune it to 97.9 MHz or 98.0 MHz. This output level should be (B) dB.
2. Adjust the built-in volume RV5 of TU1 so that the noise level when SSG input is OFF is (B) - 30 dB.

S Meter Adjustment (MDX-100RDS)

Setting:

BAND switch: FM

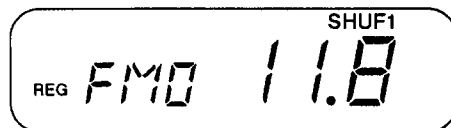


Carrier frequency: 98.0 MHz
Output level: 35 dB μ
Modulation: unmodulated

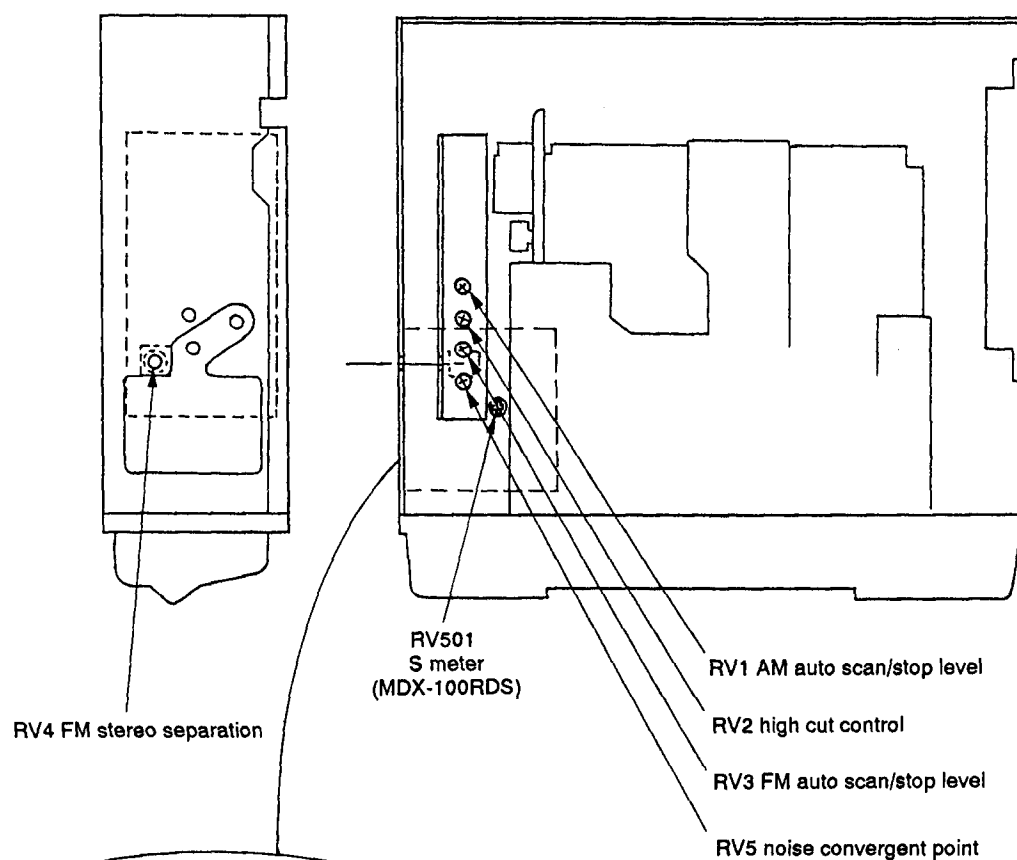
Procedure:

1. Set it the Test Mode.
2. Press the **TUNER** button and set it FM.
3. Press the **10** button and set it AD value and adjust the volume RV501 so that the AD value is 11.8.

Display window



• Adjusting Parts Location



[MAIN BOARD]

— Conductor Side —

